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COMPARATIVE STUDIES IN CIRCUMPOLAR HEALTH

Report on a WHO Working Group

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CONTENTS

Page

1. Introduction 1

2. The need for comparative and comparable data 1

3. Ways of finding available data 2

4. Making data comparable 4

5. Ways of making comparative studies 5

6. The priorities for research sponsored by WHO 6

7. Cancer among Eskimos 8

8. Ethical considerations 9

9. Recommendations 9

Annex List of participants 11

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1. Introduction

The Working Group on Comparative Studies in Circumpolar Health, which met in Copenhagen on 8 and 9 August 1981 in connexion with the 5th International Symposium on Circumpolar Health, was the first major activity under the aegis of the new programme on circumpolar health of the WHO Regional Office for Europe. Epidemiological, clinical, sociological, anthropological, psychological, and other studies are needed to assess the current situation and predict the future and so to provide a solid basis for the prevention of the possible harmful consequences to health of changes in the circumpolar regions. With this in mind the Working Group addressed itself to two interrelated problems: how to make separate studies more comparable, and how to conduct studies that compare different population groups, regions and countries. The Working Group was expected to identify the strengths and weaknesses of the current approaches, paying special attention to definitions, data collection methods, units of measurement, time periods, and so on, and to suggest and define variables for use in the research protocols for comparative studies in circumpolar health.

Welcoming the participants, the Regional Director emphasized the need to obtain comparative and comparable information to enable the World Health Organization to plan its activities as an intergovernmental organization. He also drew attention to the important role that the solution of problems in circumpolar regions could play in other regions characterized by high-risk and vulnerable groups, small and scattered populations, long distances and poor existing services. The provision of health services to people living in such conditions is one of the key components in WHO's worldwide approach to primary health care and in the global strategy for health for all by the year 2000.

Dr T. Bender was elected Chairman and Dr H. Vuori acted as Rapporteur. The list of participants is given in the Annex.

The Working Group concentrated on the following issues:

(a) the need for comparative and comparable data;

(b) ways of finding available data, with particular reference to the experiences gained by the Nordic Council for Arctic Medical Research when trying to improve computerized literature searches on circumpolar health;

(c) ways of making data comparable;

(d) ways of making comparative studies, using the basic variables of epidemiological research (persons, place, time) as a point of departure for the discussions;

(e) the priorities for research sponsored by WHO, where the Working Group tried to identify areas that are most important and amenable to comparative studies, and that would most benefit from WHO sponsorship;

(f) cancer among Eskimos, as a suitable area for research; and

(g) ethical considerations in connexion with circumpolar health research.

2. The need for comparative and comparable data

The circumpolar regions are the "last frontier" of mankind. Population pressure and dwindling natural resources will gradually force man to try to extend his habitat to areas that have previously been considered unsuitable for permanent settlement or suitable only for small native populations. The circumpolar regions will therefore become the focus of increasing attention. They will be exposed to migration, industrial exploitation and ecological changes.

Most countries with circumpolar areas, whether arctic, subarctic or antarctic, and scientists in these countries, have realized the need to obtain reliable data to be able to assess the current situation, predict trends and devise preventive and restorative strategies for circumpolar health. Consequently, considerable data already exist and further studies are being conducted. In many cases, such data have been collected to solve problems which are shared by other countries, regions or population groups as well. This data, had it been collected using uniform definitions, standards, measurement units, time periods, and so on could have been of direct relevance for other authorities and researchers as well. Unfortunately, this has seldom been the case. Not even relatively simple facts, such as the causes of death, are registered according to uniform definitions. The variability is even greater in studies using psychiatric, psychological, sociological and anthropological variables. Without authoritative recommendations concerning what and how to record, every investigator has had to develop his own measuring instruments. This tendency is often exacerbated by the fact that existing data bases do not cover all the publications dealing with circumpolar areas, thus making it difficult to take advantage of the results of earlier studies.

The usefulness of the data obtained in one circumpolar region is not just limited to other circumpolar regions. Relatively few health problems are specific to the circumpolar areas or exclusively limited to them. Consequently, the biggest problems related to the provision of health services are not caused by any specific circumpolar pathology, but by the long distances and scattered and small populations. These problems are shared by many other areas, such as arid regions and archipelagos. Such areas cover roughly one third of terra firma and provide a habitat for quite large populations. Solutions found in the extreme north and south can, therefore, be applied to benefit people living in many other parts of the world as well. In this sense, improving the comparability of data serves the north-south dialogue. These data may also be applicable when man tries to extend his habitat towards mountain tops and sea bottoms or elsewhere as the population pressure mounts. Whatever information is collected should therefore be collected in such a way that it can readily be compared with information collected in other areas sharing the same problems.

As a globally operating and intergovernmental organization, WHO also needs data without methodological bias or discordant definitions that can be readily compared between regions and populations.

The problem of comparability can be solved in two ways. The first approach is to develop common guidelines and standards for studies on similar problems carried out independently in different areas and by different investigators. If meticulously followed, such guidelines should ensure that an investigator can compare his own results with those of others although the actual investigations were planned and executed independently. The main limitation of this approach is that it relies on the perseverance of the investigator; he has to make a special effort to identify pertinent literature. This is where a well-designed literature search system is so important.

The other approach, that of conducting truly comparative studies using exactly the same research design and protocol in each different study location, is both methodologically and financially much more demanding. The usefulness of such studies has anyway sometimes been questioned. There seems to be no doubt, however, that comparative epidemiological studies are one of the most effective strategies for identifying the causes of diseases. International cooperation in biological studies has demonstrated that prospective comparative studies using a standardized protocol and conducted under the auspices of international organizations are feasible. They may be less useful in health services where they are more difficult to conduct and where there are much fewer opportunities to intervene because the political, organizational or administrative factors, that may be identified as the causes of ineffectiveness and high costs and so on, may not be amenable to manipulation in the same way as the causal factors identified in an epidemiological study.

The two approaches for increasing the comparability of the data complement each other, often in such a way that the comparison of previous findings may suggest areas where a rigorously and meticulously planned and conducted comparative study could produce very useful results. It is also clear that the establishment of definitions and other "rules of the game" serves both comparability and direct comparison.

3. Ways of finding available data

Good research begins with a review of what other investigators have already found. Studies in circumpolar health should not be any exception to this rule. Currently, there is no continuously updated bibliography specifically on circumpolar health. Literature references have to be retrieved from general biomedical and other related bibliographical sources, which can be a difficult task. Although it has been demonstrated that there is a clear correlation between extreme northern or southern latitudes and health problems, most circumpolar health problems are not specific to these areas; it is only their combination that is unique. It is difficult, therefore, to extract references related to circumpolar health proper from the ocean of biomedical research literature. The selection has to be made using a combination of several key words, such as northern/southern, sparsely populated areas, climate, coldness and darkness. Another difficulty stems from the fact that circumpolar research often has a multidisciplinary character, particularly connected with the engineering and social sciences.

To facilitate the task of those searching the literature related to circumpolar health, the secretariat of the Nordic Council for Arctic Medical Research in Oulu, Finland, has tried to develop a search profile on circumpolar health to be used in available on-line data bases (Medline, Excerpta Medica, Biosis and some data bases related to engineering and other special subject areas). In the development of the actual search request for the Medline data base, the headings included in the Medical Subjects Headings (MeSH) system have been used. The request forms developed by the Council, known as the "arctic profile", use five categories of headings: A = specific terms related to circumpolar health; B = darkness, light and seasons; C = terms related to periodicity; D = terms related to adaptation and body temperature; and E = names of geographical regions and ethnic groups. Using these categories, the "arctic profile" can be defined as follows:

A
B and C
(B or C) and D
E

A. Hypothermia
Frostbite
Cold climate
Cold
Temperature and low
Temperature and decreased

B. Darkness
Light
Seasons

C. Periodicity

D. Adaptation, biological
Adaptation, physiological
Adaptation, psychological
Body temperature

E. Alaska
Aleut
Antarctic regions
Canada
Eskimos or Eskimo
Faero or Faroe
Greenland
Iceland
Lapland: or Lapp: or Laps
Polar
Scandinavia
Siberia
Skolt
Spitzbergen: or Spitsbergen
Svalbard

A search profile for the Lockheed Corporation's DIALOG system, based on free text words, has also been developed.

The "grey literature" on circumpolar health (i.e. literature that is not being indexed for inclusion into the existing data bases) is not readily accessible. This constitutes a problem because it sometimes contains very valuable information pertaining to government policies and plans, the findings of studies sponsored by voluntary and community groups, and so on. Increased communication between the scientific communities in different countries would improve the dissemination of this material but this does not solve the problem completely. To obtain information about this kind of literature, the Council has designed a questionnaire which has been sent to major libraries and research centres in the Nordic countries. On the basis of the experience gained, this approach may be expanded to cover larger geographical areas.

The Council has tried to assess the usefulness of the "arctic profile" by asking prominent scientists to check the references obtained by means of the profile. The results have been encouraging: most items identified by the system have been relevant and the system has missed very few key references known to the experts. For the Working Group, the Siberian branch of the Academy of Medical Sciences of the USSR compiled an annotated bibliography on literature published in the Russian language. In the Soviet Union too, the opinion is that the biomedical and clinical literature can be fairly easily and reliably identified.

The Council makes the above services available, on an experimental basis, to all interested researchers and other persons.

In spite of its relevance for biomedical and clinical research the profile based on Medline has some limitations. The most important one is its reliance on MeSH, which does not adequately cover terms related to public health and social medicine. This limitation is particularly vexing from WHO's point of view. Another area that is easily missed is interdisciplinary research that focuses primarily on social sciences but has clear health connotations. These problems can only be solved by expanding the coverage of the primary data base (Medline, Excerpta Medica, etc.). There may also be problems related to the actual make-up of the "arctic profile". Although it seems to cover biomedical research adequately, it is clear that the entire approach stands or falls with the internal logic of the profile (i.e. the subject heading categories and their combinations). Consequently, the system has to be developed and evaluated continuously so as to make sure it meets the needs of the users and responds swiftly to any changes in its basic premises.

4. Making data comparable

The lack of comparability of data obtained in different studies and in different areas is, of course, not something limited to circumpolar health. It is a universal problem in research and the remedies are consequently also universal. There may, however, be some specific features that should be taken into account when applying such universal remedies in circumpolar areas. One of them is the difficulty of defining the target population. An adequate description of the target population is difficult when the vital statistics are not broken down into the relevant subcategories. Many investigations purport to focus on specific ethnic groups but it is often virtually impossible to find a pure ethnic group; special attention should therefore be paid to defining the population under scrutiny. This demand is all the more important as the groups studied are often small, which may give rise to chance variation. The time element is another problem. Circumpolar communities are often dynamic: their ways of life, population structure and environment change rapidly. If the observation time is too long, it may be impossible to distinguish between the effects of the variables that were the focus of the study and those of intervening variables, particularly secular trends. Because of this dynamic picture, official vital statistics may be misleading. They may, for instance, give a totally false idea of the number of migrants. Even native populations change quickly which makes the counting of person-years at risk difficult and unreliable.

The universal remedies include the usual good practices in reporting the results of a study, because if properly reported, data may be used by other investigators in ways that were not originally planned. The methods used have to be described in a way detailed enough to allow repetition of the study. Because the populations to be studied are often small, there is an understandable tendency to lump the subpopulations together to increase the size of the target population and to get more cases. More often than not this practice cannot be justified. In any case, the investigator should report the actual breakdown of the population by subgroups or at least make such information available. The same applies to age and sex distributions. In epidemiological and clinical studies, the definition of a case has to be unequivocal and the criteria for the inclusion in a study population specified.

Existing classifications, such as the International Classification of Causes of Death and the International Classification of Impairments, Disabilities and Handicaps should be used. Similarly, for many diseases there are more or less universally accepted diagnostic criteria such as the revised Jones criteria for rheumatic fever or the WHO criteria for hypertension. It might be a good idea in the future to follow closely the development of the new indicators suggested and developed by WHO for monitoring the progress towards health for all by the year 2000 and to apply them as much as possible.

In studies using laboratory methods, the measurements and measuring instruments should be subjected to standard quality control and standard references should be used. The editors of scientific journals have a role to play here by insisting on full reporting including references to quality control measures used in connexion with the data collection.

Finally, it is clear that even the most reliable and interesting data are useless if they are not known to other researchers. The "arctic profile" is a step forward in this respect. Other possible ways of improving the dissemination of information include the foundation of an international association for circumpolar health, responsible for the publication of a scientific journal, and international meetings. The International Symposia of Circumpolar Health serve as a valuable forum where researchers coming from different countries can meet. The value of such gatherings would be enhanced if special efforts were made to make them truly interdisciplinary meetings, bringing together researchers with different backgrounds, who normally tend to communicate only with their colleagues. This would help to solve the problem of misunderstanding the language of - and thus the contribution to be made by - other disciplines. For instance, sociologists, anthropologists, and representatives of preventive and clinical medicine not only use different terminology and jargon but also have a different mentality. Exposing them to each other would increase mutual understanding, trust, respect and cooperation.

Part of the information is produced by bodies such as government authorities which do not usually publish their findings in scientific fora. Government planners, administrators and researchers should be encouraged to publish their results using the same channels as the scientific community. The questionnaire approach developed by the Nordic Council can be helpful in identifying literature which remains outside such channels. Fortunately, the government authorities are increasingly realizing the value of attending scientific gatherings such as the International Symposia, which makes their findings more widely available. Government authorities are also notorious for poor horizontal communication, e.g. between various ministries, and improved intersectoral collaboration is therefore required. For instance, education authorities in many cases need and could make use of health-related studies, if the health authorities were to make them known and available.

A very important area where comparative studies are needed is in the field of cross-cultural mental health research. This has been a difficult area in which to obtain results, but the cross-cultural mental health instruments (the psychiatric symptom inquiry) developed by WHO show great promise.

5. Ways of making comparative studies

Truly comparative studies, where all data items to be collected and the methods of collecting them have been rigorously defined in advance, have both theoretical and practical value in epidemiology and may, in fact, be indispensable when attempting to ascertain the causes of diseases. In health services research such studies may be of more academic interest. For instance, it is interesting to know whether, and how, the organization and functioning of health services depends on such factors as the political and economic system and the social structure of the country, but the practical implications of such findings are limited because it may be virtually impossible to change the independent variables even if it is demonstrated that they exert a deleterious effect on health services. In addition, comparative studies in health services research are very complex and costly, because there are few opportunities to exert control, randomize, etc. The following discussion therefore mainly concerns epidemiological studies, although the main points apply to social, behavioural and health services research as well.

One of the planned outcomes of the Working Group was to suggest internationally acceptable definitions for the major variables to be used and measured in studies pertaining to circumpolar health, as well as to determine the minimum set of data required in comparative studies, to ensure a meaningful basis for health planning. This task was clearly too ambitious to be accomplished by one working group. It was therefore decided to concentrate on general issues and principles related to the selection of variables to be used in such studies, rather than on suggesting definitions of specific variables and methods for their measurement. This decision was prompted by three general considerations: setting requirements too high in a relatively new field could inhibit useful research; it is more economical to start by choosing priority research areas first, thereby limiting the range of possible variables to be included, and then to proceed to the definitions of variables and methods; and the most relevant and interesting variables depend on the problems and populations to be studied.

In epidemiology, the interesting variables can be grouped under four headings: health problem (disease), person, place and time.

Health problem. As in the case of making studies comparable, the most important recommendation is that standard classifications and diagnostic criteria should be used when they are available.

Person. One of the reasons for the increasing interest in circumpolar health studies is the assumed ethnic homogeneity and the specificity of the genetic traits of the native populations. The homogeneity may, however, be illusory. To avoid misleading conclusions, special attention has to be given to the determination and definition of the ethnic origin of the subjects. This may be possible, though often costly, in special studies, but virtually impossible in any form of routine data collection where inquiries concerning ethnic origin may be resented or, at best, where one has to rely on self-reporting with all its biases. A corollary of the difficulty of determining ethnic origin is the fact that studies often have to be limited to relatively small populations.

Given the rapidity of social change and its profound impact on health, variables characterizing a subject's position in the social system are often particularly useful. The very reason why they are useful - the rapidity of change - may, however, render their measurement difficult and their use dubious. For instance, current occupation may be completely insufficient to describe the subject's exposure to environmental or occupational hazards.

When deciding what data should be collected on these subjects, the following check list can be consulted:

1. ethnic origin/race
2. sex
3. age and birth date
4. weight and height
5. birth order
6. parity
7. occupation
8. education
9. vocational training
10. literacy
11. marital status (and ethnic origin of the spouse)
12. socioeconomic status
13. dependency status and status in household
14. degree and nature of contacts with other major ethnic groups (particularly for the native population)
15. religion
16. health status and disabilities (particularly congenital abnormalities, accidents, and sensory impairments)
17. utilization of traditional medicine and reliance on lay- and self-care

Place. Some of the variables used to describe the place where the phenomenon under scrutiny takes place also characterize the persons to be studied.

1. current residence (urban vs. rural, administrative status, etc.) and length of stay in current residence (or other locality of interest)
2. place of birth
3. place of origin
4. geographical features
5. environmental conditions
6. climatic conditions
7. distance from, and access to, different types of health service
8. recreational facilities
9. housing (light, humidity, insulation, etc.)
10. crowdedness (both locality and housing)
11. place of work (indoor vs. outdoor, special characteristics)

Time. One of the problems with data from different countries and studies is that they are partitioned differently with regard to time. Although a study may cover a long period of time, it is usually preferable to report the data using relatively short intervals because of the rapid demographic and social changes already referred to. For the same reason, it is necessary to specify exactly the years to which the data pertain. Because of marked seasonal variation, it is often necessary to indicate the exact calendar time as well. For many studies, such as the consequences of alcohol consumption, the day of the week is also important. When studying diseases, it is important to record the onset of disease and the time of exposure to an agent or an environmental condition.

6. The priorities for research sponsored by WHO

There are three obvious areas of circumpolar health where research is needed and where WHO's sponsorship would greatly enhance the likelihood of success: epidemiology (and related psychological, sociological and anthropological studies), health services and environmental health. The following does not purport to be an exhaustive analysis of the research needs and opportunities in these areas but rather selected suggestions for further consideration, mostly based on the deliberations of an earlier WHO working group in 1979.[a] Problems related to environmental health are excluded because another WHO working group has recently discussed them.[b]

The recommendations for research priorities of the 1979 Working Group still seem to be valid.

1. Family health:

   - family related pathology, particularly psychopathology (e.g. the battered child syndrome, alcoholism)
   - the problems of the elderly in isolated, underserved and demographically rapidly changing communities
   - the problems of "non-families", including the "intermittent husband syndrome"

2. Noncommunicable diseases:

   - cancer, particularly the monitoring of trends
   - cardiovascular diseases, particularly the monitoring of trends and development with age
   - autoimmune diseases

3. Communicable diseases:

   - "family infection"
   - otitis media
   - hepatitis

4. Psychosocial problems:

   - suicide
   - alcoholism

5. Adaptation to adverse environmental situations:

   - biological adaptation ("sprinters" and "stayers")
   - psychological adaptation ("polar tension")
   - the selection of migrants to circumpolar regions
   - "northern pharmacology"

One of the most characteristic features of native as well as of migrant populations living in the circumpolar areas is rapid demographic change. Although monitoring vital statistics and demographic variables is a routine task of the census bureau or corresponding authorities rather than a research task for the scientific community, the profound impact of demographic changes on all aspects of life renders a detailed study vitally important. Furthermore, the existing statistics and data collection methods often lump together different population subgroups thus concealing important trends. The rapid turnover of the population of a given locality may render such statistics totally meaningless as they will not accurately reflect the situation. Nevertheless, there are some interesting features, such as persistently high infant mortality among the natives, which are known but have not been subjected to a study detailed and vigorous enough to find out the causes.

Another obvious monitoring task is to observe changes in mortality and morbidity. It has been claimed that communicable diseases are losing their importance. If this is really so what about, for instance, venereal diseases, otitis media, pneumonia and hepatitis? The incidence of tuberculosis may have greatly declined, but has it been replaced by something else? Many chronic diseases have been relatively rare among the native populations, partly because of their relatively short average life expectancy, but they are now increasing. This could be a natural epidemiological experiment which could yield valuable clues about the etiology and prevention of these diseases, in the time-honoured tradition of the Broad Street pump and Panum's studies on measles. The value of such observations is enhanced by the fact that the trends are sometimes the opposite to those observed in the more temperate latitudes, as in the case of cardiovascular diseases. On the other hand, accidents as a cause of death and disability follow the trends in other parts of the world. Accidents would be a particularly good subject for study as they are closely related to changing lifestyle, high consumption of alcohol, etc. Furthermore, accidents plague both the migrant and local populations and people living and working both in the extreme north and in the extreme south.

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[a] Health problems of local and migrant populations in arctic regions: report on a Working Group. Copenhagen, WHO Regional Office for Europe, 1979 (unpublished document ICP/PHC 010)

[b] Environmental health problems in arctic and subarctic areas: report on a Workshop. Copenhagen, WHO Regional Ofice for Europe, 1981 (unpublished document ICP/BSM 003)

Some countries have ambitious plans concerning the exploitation of their circumpolar areas. The success of such schemes may hinge upon finding ways of facilitating the adaptation of the settlers and preventing the hazardous effects of culture shock in both the settlers and the native population. The selection of migrants most likely to adapt successfully also warrants study and might be a subject for a future WHO working group. The findings of the Soviet scientists on the "sprinters" and "stayers" are most interesting in this respect. In the extreme conditions of the circumpolar areas, the sensory organs play a particularly important role as a determinant of the quality of life, work performance and adaptation. Prospective studies on sensory impairments would therefore be both important and informative, for a better understanding of the process of aging for instance.

Unsuccessful acculturation can have particularly grave mental health consequences. This applies both to the migrants and to the native populations, who may be called "reverse migrants" as their environment changes so rapidly. There is already a considerable amount of data on the prevalence of mental health problems. What is now needed is an analysis of the determinants of these problems so that the focus of activities can be shifted towards prevention. This analysis will, in all likelihood, demonstrate once more the importance of lifestyle - an area of interest shared by students of health and anthropologists. The role of alcohol deserves special attention as the traditional cultures of the circumpolar areas do not have any artifical chemical stimulants. The native populations, therefore, lack "cultural immunity" against alcohol and suffer particularly problematic reactions.

As to health services research, besides the obvious task of studying the different approaches to providing health services, paying special attention to their effectiveness and costs, it might also be worthwhile to study the providers themselves. Who are they, where do they come from, what are their qualifications and motivations, what is their turnover rate, how do they master the culture and language of the local population and how do they influence the natives?

Finally, the circumpolar regions and populations might provide a particularly interesting and suitable venue and subject of studies on "positive health", similar to, for instance, the Alameda County studies. The extreme conditions of the circumpolar areas provide an opportunity to test the validity of the positive health approach and, if applicable, the results might provide a starting point for encouraging lifestyles and habits that promote health.

7. Cancer among Eskimos

Although all of the above topics are important, the Working Group decided to recommend cancer among Eskimos as the first research activity sponsored by WHO under the aegis of its new programme on circumpolar health.

There are several reasons for this recommendation.

(1) Cancer is becoming increasingly important among the Eskimos.

(2) The study of cancer among ethnically definable and geographically isolated populations may yield significant clues concerning the etiology and prevention of cancer in general.

(3) Earlier studies have suggested interesting differences in cancer incidence both between Eskimo populations and other populations and between Eskimos living in different countries. The analysis and interpretation of such findings is, however, rendered difficult because of the small numbers included in national studies and a lack of uniform definitions.

(4) WHO's sponsorship would greatly facilitate the inclusion of all relevant population groups in such a study and the development of uniform definitions of terms and measurements.

An epidemiological survey of all malignant diseases in Greenlandic Eskimos has demonstrated a significantly higher risk of cancer in the nasopharynx, salivary glands and oesophagus for Eskimos than for the Danish population. The incidence of choriocarcinoma in relation to the number of births was one of the highest on record. Low risk was found for cancer of the breast, endometrium, larynx and prostate. Similar results from Alaska and Canada have been published but all of these studies suffer from small numbers and lack of comparability. A more standardized approach to the registration of all cancer in Eskimos would provide larger numbers and permit data to be combined in order to allow more meaningful comparisons over time, between subgroups, and with other ethnic groups. Such data could also form the basis for collaborative analytical epidemiological studies of the risk factors associated with certain types of cancer, and for possible control or prevention.

WHO's involvement in the project could have the following objectives:

(1) to develop a standardized registration of all malignant diseases in persons of Eskimo origin;

(2) to establish common principles and definitions; and

(3) to facilitate the investigation of the etiology and epidemiology of selected types of cancer occurring in this unique population.

The first step towards achieving these objectives could be for WHO to convene a working group of cancer researchers from all the concerned countries (Canada, Denmark, Greenland, the Soviet Union and the United States) to develop the research design of the study. The results of this working group could be presented at a special session of the 6th International Symposium on Circumpolar Health to be held in Alaska in 1984.

8. Ethical considerations

Many circumpolar communities - both native and immigrant - are in statu nascendi and consequently attract the attention of researchers who are looking for "natural experiments" and interesting population groups to test their hypotheses. For these researchers, the circumpolar areas and populations are part of a worldwide laboratory and provide ready-made control groups. It has been suggested that this quest for control groups should be actively exploited to advance circumpolar research. Projects which are of intrinsic value for circumpolar health could perhaps be "sold" to outside institutions, who often have far greater resources than those operating in the circumpolar regions, and could include the circumpolar component as a subproject or control group in a larger study which lies in their field of interest.

There is also a need to establish a benchmark, a reference point against which the future development in a rapidly changing society can be compared. Furthermore, many of the problems are so acute that immediate action-oriented research seems to be called for.

These motives for intensified circumpolar research are perfectly legitimate per se but may pose ethical problems. The circumpolar communities, particularly the native ones, may become overresearched and the people may feel that they are being used as guinea pigs. Action research may be well-meaning, but can badly disrupt the natural social web of these communities. It has been claimed that the traditional societies are disintegrating and therefore that no special harm will be done if this process is redirected or accelerated by research. Such claims do not, however, justify research that starts from the premises of the researcher alone. Too often, what appears to be a problem, and particularly a researchable problem, has been defined exclusively by the researcher who is pursuing his own interests.

When dealing with native groups, who are often underprivileged, it is ethically mandatory to involve the community, in the true sense of community participation, in the setting of priorities and the establishment of objectives of research. This opportunity should be extended not only to the local decision-makers but to the "rank and file" members of the community. Such community participation may also involve providing the community with an opportunity to participate in the actual conduct of the study. The first criterion in selecting research topics must therefore be that it concerns a problem which is considered such by the target population and that the results are likely to contribute to its solution. The preventability of a health problem is therefore an important consideration. The setting of priorities can, of course, be assisted by cost-benefit calculations but it should be noted that the benefits usually occur after a considerable lapse of time. The rapid demographic and social changes that take place during this period may render the benefits irrelevant to the assumed beneficiaries.

9. Recommendations

The Working Group made the following recommendations.

For the scientific community

1. In selecting research priorities and topics in circumpolar health, special consideration should be given to studies whose results have relevance for other regions, such as arid areas and

archipelagos, which share the problems of circumpolar regions (such as small and scattered populations, long distance and extreme climatic conditions).

2. The collection of data on circumpolar health, routinely or in connexion with special studies, should be done in a way that maximizes its comparability with data emanating from other countries, population groups or studies. Standard classifications of health problems and other existing classification schemes should be used whenever possible. Special attention should be paid to such questions as reporting periods, the definition of terms, the choice of reference populations, etc.

3. Special attention should be paid to the influence of rapid demographic and social changes on such factors as the time period to be covered and the target population.

4. If data is pooled, the original data by subgroups should be made available. The criteria for including a subject in the study population have to be explicit and unequivocal.

5. The standard practices of good scientific reporting and quality control of methods must be followed.

For WHO

1. WHO should promote comparative studies in circumpolar health by initiating research projects, and by facilitating contacts between scholars from different countries, representing different disciplinary and professional backgrounds.

2. WHO should disseminate the results of circumpolar health research by publishing them and by convening meetings. WHO should also participate in the meetings organized by the scientific community.

3. WHO should develop its own programme in circumpolar health in accordance with the needs of the Member States, paying special attention to the priorities set by the local population (be it native or migrant).

4. WHO should assist in attempts to develop literature search systems for circumpolar health.

5. WHO should foster a multidisciplinary and multiprofessional approach and encourage community participation in its own activities and in those in which it participates.

6. WHO should actively encourage the other members of the UN family to participate in activities designed to promote the wellbeing of populations living in the circumpolar areas.

7. WHO should act as a link between the north and the south, bringing together national health authorities, intergovernmental and nongovernmental organizations, and researchers interested in arctic and subarctic as well as antarctic regions.

8. WHO should support the study of cancer among Eskimos and convene a working group on the criteria for the selection of personnel to work in extreme climatic conditions.

Annex

LIST OF PARTICIPANTS

TEMPORARY ADVISERS

Dr T.R. Bender
Alaska Investigation Division, Centers for Disease Control, Anchorage, Alaska, USA (Chairman)

Dr P. Fugelli
Assistant Professor, Institute of General Practice, University of Oslo, Norway

Dr A. Green
Institute of Clinical Genetics, Odense, Denmark

Professor S. Haraldson
Träslövsläge, Sweden

Professor V.P. Kaznacheev
Presidium Siberian Branch, Academy of Medical Sciences of the USSR, Clinical and Experimental Medicine, Novosibirsk, USSR

Professor Kulikov
Presidium Siberian Branch, Academy of Medical Sciences of the USSR, Clinical and Experimental Medicine, Novosibirsk, USSR

Associate Professor J. Leppäluoto
Secretary-General, Nordic Council for Arctic Medical Research, Oulu, Finland

Dr P. Schioler[a]
Ministry of Education, Copenhagen, Denmark

Professor N. Simpson
Department of Paediatrics, Queen's University, Kingston, Ontario, Canada

WORLD HEALTH ORGANIZATION

Regional Office for Europe

Dr J.H. Henderson
Regional Officer for Mental Health

Dr J.-P. Jardel
Regional Officer for Information Systems Programme

Dr L.A. Kaprio
Regional Director

Dr G. Lamm
Acting Regional Officer for Chronic Diseases

Dr B.Z. Nizetic
Regonal Officer for Research Promotion and Development

Dr H. Vuori
Regional Officer for Primary Health Care (Rapporteur)

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[a] Participation expenses not paid by WHO

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